REMARKS

Claim amendments

Certain amendments have been made to the claims to conform to US claiming format and for clarity. It is not believed that the scope of the claims has been altered.

Claim rejections 35 USC §102

Claims 1, 6-8 and 10-12 are rejected as anticipated by Rebsdorf (US6,619,918). For the reasons discussed below, the applicant respectfully traverses the rejections.

Background

As a preliminary matter, it is believed important to point out to the examiner several important technical differences between the present invention and Rebsdorf.

As discussed in the present specification, and as mentioned in Rebsdorf at column 1, linen 14 - 20, conventional wind turbines vary the pitch of the blades in various wind conditions in order to optimize the operation and produce as much power as possible. This is achieved, *inter alia*, by adjusting the pitch of the blades such that the rotation speed is maintained as close as possible to the maximum output of the wind power plant. (e.g., unnecessary high rotation speed is reduced in periods with high wind velocity).

A second consideration, and the one that is the focus of Rebsdorf, is that high wind velocity may damage the blades, in particular gusts that occur at around the nominal wind velocity. Such gusts may in extreme situations cause the blade tips to hit the tower. Rebsdorf describes known conventional means of dealing with this problem at column 1, lines 20-31 (over-dimensioning the blades, or stopping the turbine entirely). Rebsdorf thereafter explains in detail his method for addressing this problem by directly measuring dangerous mechanical loads on the blades

rather that relying on statistical averages, such that the turbine may be operated in an aggressive manner except when the wind conditions are actually precarious.

A third problem exists, however...one that is not mentioned at all in Rebsdorf, and one that is the focus according to one aspect of the present invention. This third problem is that when conventional wind turbines attempt to optimize the power output by altering the pitch of the blades (jfr. consideration 1 above), the pitch-alterations themselves will cause variations in thrust forces acting on the turbine. These variations (both large and small) cause stress that will over time cause fatigue in the entire installation. On the other hand, variation in thrust forces can be *reduced* by making pitch adjustments with that goal in mind, but such "stress-reducing" adjustments may come at the expense of power optimization. The present invention is directed to keeping the "stress-causing" type of pitch alterations to a minimum so as to reduce long term fatigue, while at the same time keeping the power output within an acceptable power output range.

Additionally, according to another aspect, the present invention provides a means for rotating the direction of the wind turbine about its vertical axis by cycling the pitch angle of the rotor blades. Rebsdorf is not concerned with, and does not mention, this consideration either.

Claim 1

Claim 1 provides the feature of establishing an output power range. Rebsdorf does not teach this feature. The applicant respectfully disagrees with the examiner that the cited passages from Rebsdorf disclose this feature. The cited passages teach that certain parameters are measured, and in particular that mechanical loads on the blades are measures and controlled so that a safety distance is maintained between the blade tips and the tower. Nowhere does Rebsdorf disclose the establishing of an output power range however.

Claim 1 provides the additional feature that if the measured output power is within such range, then "stress-reducing" type pitch adjustments are made (which as described above may come at the expense of optimal power output) . Rebsdorf contains no teaching of making such a

determination or correction. This is not surprising since Rebsdorf is unconcerned with this problem, except to the possible extent that avoiding a sudden wind gust could be considered "minimizing thrust variations". But even accepting this generous interpretation, Rebsdorf does not make adjustments relative to power output, but rather to mechanical stress, and does not make adjustments based on a position within a range, but rather with respect to a maximum safety limit.

Claim 1 further provides that if (and only if) the output power is outside the established range, then (possibly stress-inducing) pitch corrections are made in order to bring the power output back within that range. The applicant respectfully believes that the examiner has misread Rebsdorf, as Rebsdorf contains no such teaching.

Claim 6 is believed novel at least based on its dependence from claim1.

With respect to claim 7 and 8, Rebsdorf does not contain any teachings related to the direction of the wind power plant, much less that errors in the power plant's direction may be corrected by altering the pitch angle of the blades, or that a range is employed. Again, Rebsdorf is not concerned with the direction of the power plant or any issue other than the mechanical stresses on the blades themselves.

Claims 10 and 11 are believed novel at least based on its dependence from claim1.

With regard to claim 12, Rebsdorf discloses a wind turbine having a stationary tower, therefore Rebsdorf could not possibly contain any teaching that the pitch angle of the blades can be used to control motion of the tower (such as occurs in offshore, floating towers)

Claim rejections 35 USC §103

In as much as the examiner has not identified any combination of references that disclose all of the features as discussed above, a prima facie case of obviousness has not been established. In addition, the following arguments are made with respect to claims 2

Claim 2 contains the feature that the minimization of thrust variations is made by regulating towards a calculated thrust value. Rebsdorf does not regulate *towards* a specific thrust value, but rather attempts to *avoid* an unsafe value. In addition, this unsafe value in Rebsdord is not different for different average wind velocities, but is an absolute value. Rebsdorf attempts to avoid an unsafe situation, and if the wind velocity approaches a value that is unsafe then action is taken. The point at which action must be taken does not change depending upon average wind velocity, the only thing that "changes" is whether or not action must be taken. The present invention, as claimed in claim 2, provides for establishing different target thrust values for different average wind velocities. Rebsdorf contains no such teaching.